Culture Reexamined

Broadening Our Understanding of Social and Evolutionary Influences

Edited by Adam B. Cohen
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Scholars of religion have long assumed that religions offer benefits and fulfill the needs of individuals and that these benefits can explain why religions exist. Religion’s ascribed functions include pacifying existential angst (e.g., Darwin, 2004; Durkheim, 1915/2001; Geertz, 1973), creating meaning in a natural world inherently devoid of meaning (Bering, 2011; Inlicht, Tuller, & Good, 2011; Rappaport 1979), and coping with death anxiety (e.g., Becker, 1973; Spiro, 1987). Religions are, however, more than answers and cures for the psychological concerns of individuals. Religions also solve social and ecological problems faced by groups of people, and it is likely that religions have responsively adapted to serve these roles from their beginnings. In this chapter, we explore evolutionary analyses of religion that aim to explain how...
religions solve many of the social and ecological challenges faced by communities of individuals trying to live together.

First, we discuss the major distinctions between cultural functionalist theory and evolutionary functionalism. Evolution-minded social scientists are often faced with charges of endorsing functionalism, which continues to be a “dirty word in the social sciences” (Sharrock, Hughes, & Martin, 2003, p. 15). Here, we focus on a number of commonly expressed problems associated with cultural functionalism and on how in both theory and practice, evolutionary functionalism overcomes such limitations. We then review some of the evidence that demonstrates the conditions under which religions provide solutions to social and ecological problems faced by particular communities. Finally, we discuss avenues for further research and stress the importance of maintaining the theoretical and methodological pluralism that currently flourishes within the evolutionary study of religion.

CULTURAL FUNCTIONALISM VERSUS EVOLUTIONARY FUNCTIONALISM

In anthropology, functionalism has come in many forms over the years, ranging from the more sociologically oriented structural-functionalist schools of Lévi-Strauss (1983) and Durkheim (2001) to the cultural materialist and ecological schools of Harris (1966) and Rappaport (1979, 2000). Malinowski (1964), the titular founder of functionalism, defined function as the “satisfaction of a need” (p. 159). He offered five components that make up his vision of culture, three of which are key to understanding his thought:

- Culture is essentially an instrumental apparatus by which man is put in a position the better to cope with the concrete specific problems that face him in his environment in the course of the satisfaction he needs.
- It is a system of objects, activities, and attitudes in which every part exists as a means to an end.
- Such activities, attitudes, and objects are organized around important and vital tasks into institutions such as the family, the clan, the local community, the tribe, and the organized teams of economic cooperation, political, legal, and educational activity. (Malinowski, 1964, p. 150)

Malinowski considered the essential core of cultural domains to be functional; they contain within them the means by which to overcome environmental problems to satisfy needs and “every part exists as a means to an end” (p. 150). Therefore, any successful functional analysis of a cultural system, such as religion, entails understanding the constituent parts’ relationships and what their particular end is, even if that end is merely to fulfill the other components’ functions. However, a number of problems have been identified with such functionalist accounts of human social systems.

For example, many have taken issue with some cultural functionalists’ heavy reliance on interpretation and their lack of a systematic method for data collection (e.g., Spier, 1996). Harris’s (1966) classic explanation of the sacramentalization of cattle in India, for example, is a regular target for such critiques. Harris argued that Indians taboo the killing of cattle because the utility of keeping them alive for things such as fuel and milk outweighs the benefits reaped by eating them. Bloch (1983) critically pointed out the ad hoc nature of the explanation: “Harris notes that cows are holy in India and then looks around for anything that will show the belief to be reasonable in terms of the economy” (p. 133). Indeed, strong correlative interpretivism and weak methodology characterize much functionalist and other anthropological research throughout the middle of the 20th century. Evolutionary functionalists, however, have made use of a vast array of research methods to avoid the trappings and limitations of interpretive ethnographic inquiry, as is evinced by the studies we review next (which are themselves just a small sampling).

The apparent lack of agency in functionalist accounts has been another target for criticism (for further discussion, see Elster, 1979). In other words, functionalist accounts often lack consideration or minimize the significance of individual motivations and decision making in the formation of institutions and social systems. As a response to this, rational choice theorists have emphasized individuals’ beliefs and desires in the process of decision making. However, the classic (but often confused) distinction between teleology—an intentional function—and teleonomy—functional by design of evolutionary processes—has to be taken into consideration here (Pittendrigh, 1958). Individuals’ intentions and decisions may indeed have something to do with their well-being (see Spiro, 1987), and their internal states can, at times, accurately represent the fitness value of a particular strategy. That is, proximate intentions can align with ultimate explanations. Alternatively, however, the proximate, consciously obvious goal can be quite removed from the ultimate, teleonomic purpose for a given behavior, ritual, or teaching. That is to say that group members engaging in a particular ritual might understand the teleonomic group benefit offered by the ritual, or they may conceive of it as beneficial for a radically different reason. People’s conscious intentions can consist of a wide range of things, but what matters for evolutionary functionalism is how the behavior affects fitness (see Hames, 1991, 2007; Smith & Wishnie, 2000, for excellent discussions of this distinction with respect to the evolution of conservation practices).
Another common problem identified with functionalism stems from an alleged essentialization of culture. For instance, Collier et al. (1997) noted that the flaw in Malinowski's argument is the flaw common to all functionalist arguments: Because a social institution is observed to perform a necessary function does not mean either that the function would not be performed if the institution did not exist or that the function is responsible for the existence of the institution. (p. 73)

In other words, Collier et al. took issue with the idea that an institution is inextricably linked with its function or that a function plays a causal role in the formation of an institution. Moreover, they suggested that functionalist analyses essentialize the social context with the institution. Of course, an institution can exist longer than its constituent participants and its function can change, and humans are particularly adept at finding ways to solve problems by formalizing behaviors that work around them. Analytically, however, all one needs to see are an institution's effects to claim it has a function, regardless of whether it is true. This problem with functionalist institutional analysis is that institutions are thought of as essential to a society. Evolutionary analyses (pace Gould, 2002) tend to essentialize functions for traits because traits often serve different purposes in different contexts. Likewise, anyone with a modicum of understanding of the ethnographic record cannot deny the diversity in content of religion, and careful arguments must address the possibility that different religions overcome or address problems posed by local environments.

In fact, in some situations, ignorance of the individual over the ultimate teleonomic purpose of a behavior is critical to convincing the individual to partake. Although individuals may be content to engage in an activity because they are aligned with its proximate purpose (say, pleasing the gods), the hidden ultimate purpose may be something that runs counter to their interests. For example, compelling people to avoid cheating, resource hogging, or promiscuity may, as we describe, be instrumental to group success but can often come at a cost to a rationally acting individual. The powerful proximate reasons that religions provide to compel individuals to engage in ultimately self-sacrificing (but group-beneficial) behaviors is, from the perspective of evolutionary functionalism, one of the great strengths of religious systems.

A third criticism of many functionalist accounts is the apparent lack of a feedback mechanism to sustain the movement of elements within the system. In other words, to be convincing and complete, functionalist accounts require a force external to the system to reconstitute, maintain, and reproduce elements within the system (Elster, 1979, 1982; Sperber, 1996). The combination of natural selection and genetic transmission is one obvious feedback mechanism, but as Stinchcombe (1968) pointed out, other forms of selection and transmission—for example, cultural evolution—can serve as feedback mechanisms as well. What functionalist accounts often lack is attention to the ecological pressures that led to the emergence of an institution and the fitness effects that could explain its persistence.

Again, methodologically, cultural functionalism has largely been interpretative; one studies an institution and discovers the problem it solves, and this analysis is carried through to other domains of a population's experience. However, researchers must empirically demonstrate that the institution or trait under examination produces benefits that are not available to those who lack the institution or trait. The problem for those who study religion, however, is finding a sufficient control sample (cf. Sosis & Bressler, 2003) and, as such, researchers are often limited to evidence that allows them to abductively conclude that particular traditions benefit individuals and communities in particular contexts.

How Evolutionary Functionalism Can Explain Religion

Currently, a complete evolutionary functionalist analysis of any religious system is lacking; however, plenty of evidence has nonetheless suggested that religion is adaptive in specific ecological contexts. Although this evidence relies primarily on cultural evolutionary processes by which cultural information—in the form of beliefs, rituals, and teaching—are selected and transmitted, the approach mimics that which naturalists use to understand why organisms have the particular features they do.

Here, we review the arguments and evidence for six of the most prominent hypotheses regarding religion's cultural adaptations for enabling, sustaining, and facilitating social interaction in human groups. We also note open questions that remain and avenues of future research that may address them.

Hypothesis 1: Monitoring and Punishing Selfish Behavior

Although many nonstate traditions have traces of moralistic deities (Boehm, 2008), anthropologists have understood for at least half a century that these types of morally involved "big" gods are found predominantly in state-level social organizations (Swanson, 1960; Wallace, 1966). In the absence of effective top-down secular institutions, such as policing and court systems, to regulate ethical behavior, groups of this size face considerable challenges in preventing the destabilizing forces of free riding and defection. Genetically evolved mechanisms, such as kin-based altruism and reciprocity
with nonkin, are only able, on their own, to sustain very small groups—much smaller even than the towns that sprang up 9,000 to 11,000 years ago in the Levant (Dunbar, 2003; Henrich, 2004). At this size, anonymous encounters become increasingly frequent and, with them, so too do the opportunities to engage in selfish, other-damaging, unethical behavior without sacrificing one’s reputation.

A number of researchers have argued that commitment to omniscient and morally binding supernatural agents facilitated cooperation by discouraging believers from cheating in these otherwise anonymous situations (Lahti, 2009; Rappaport, 1979; Sanderson, 2008; Schloss & Murray, 2011; Shariff & Norenzayan, 2007; Stark, 2001). Furthermore, knowing that a potential interaction partner fears supernatural reprisal for violating social norms builds faith in the moral constraints on this partner’s behavior and thus heightens trust among people. These hypotheses have received ample empirical support from several different fields. First, psychological studies have shown that people primed to think about God and other supernatural agents are more cooperative, more honest, and more generous to strangers in anonymous situations (Ahmed & Salas, 2011; Piazza, Bering, & Ingram, 2011; Randolph-Seng & Nishein, 2007; Shariff & Norenzayan, 2007). Second, cross-cultural research has shown that these types of effects are significantly more likely to occur when individuals believe in powerful, omniscient, and moralizing big gods than in localized gods (Heinrich et al., 2010; Johnson, 2005). Third, people do indeed use other people’s religiosity as a powerful cue of trust (Gervais, Shariff & Norenzayan, 2011; Tan & Vogel, 2008).

The threat of supernatural punishment, in particular, seems to have a much stronger effect than the promise of supernatural reward. Controlling for relevant variables, people who more strongly believe in a punishing God than a loving and comforting God are less likely to cheat in academic settings (Shariff & Norenzayan, 2011), and those countries that have higher rates of belief in hell and lower rates of belief in heaven also tend to have lower crime rates (Shariff & Rhemtulla, 2012). In fact, indications are that when individuals emphasize God’s forgiveness over God’s vindictiveness, it actually encourages norm violations (DeBono, Shariff, & Muraven, 2012).

Anthropological work has shown that those societies in which cooperation was especially important and especially difficult to sustain using basic processes of kin selection and close reciprocity—such as larger societies or societies that faced acute resource shortfalls—were more likely to develop widespread beliefs in big gods (Roes & Raymond, 2003; Smiley, 1996). These findings suggest that supernatural punishment may have emerged to facilitate the management of limited resources. Considered together, the results emerging from this line of research suggest that of the multitudes of forms supernatural deities have taken and could have taken, those now endorsed by the greatest number of people—specifically, powerful, omniscient, and morally involved gods—evolved because of the moral cohesion that they offered large groups of people. These types of gods thrived because the societies they were attached to managed to succeed where less cohesive groups could not.

Hypothesis 2: Resource Regulation and Management

One of the avenues by which regulated behavior among individuals fosters greater success among groups is the wise management of shared resources—preventing “commons” from becoming tragedies (Hardin, 1968). Durkheim (1915/2001) noted that this type of resource regulation was an example of religion’s secular utility. In a well-known example—mentioned earlier—Harries (1966) argued that cattle are sacredized in India because the benefits from the prohibition of slaughter outweigh the benefits of eating cattle. According to Harries, this institutionalized prohibition makes ecological sense for Indians engaging in the practice; if cattle are sacred and not to be slaughtered, then Indians maintain the secular utility of keeping cattle alive for plowing, milk, and dung for fuel. However, Harries’s analysis failed to demonstrate that those living under similar conditions who did not sacramentally conserve cattle had lower caloric returns or fertility or wealth or any other indicator of fitness.

In Rappaport’s (1968/2000) classic study, Pigs for the Ancestors, he argued that ritual among the Tiembaos Maring of New Guinea serves a variety of functions. First, ritualized mass pig slaughters are timed at points when pig population sizes become too cumbersome and parasitic on resources used by humans. The slaughter, according to Rappaport, helps to maintain an undegraded environment, limits fighting to frequencies that do not endanger the existence of the regional population, adjusts man-land ratios, facilitates trade, distributes local surpluses of pig to the form of pork throughout the regional population, and assures people of high-quality protein when they most need it (p. 224).

Subsequent theoretical models have been mixed in their support for Rappaport’s (1968/2000) suggestion about the social utility of the rituals (e.g., Anderey, 1998; Foin & Davis, 1984; Samuels, 1982; Shankins & Behrens, 1973), but such models still await quantitative empirical testing.

Nevertheless, some studies have produced reliable evidence of higher returns for religiously sanctioned resource management. In a landmark study, Lanning (1987, 1991; Lanning & Kramer, 1993) argued that the religious system among the Balinese teleonomically and strategically mediates water distribution to complex networks of artificially constructed terraced rice paddies operated by cooperative units of people (sabah). The rice paddies depend on supernaturally sanctioned irrigation practices that affect the nutrient content...
of the water, regulate pests, and maximize sunlight exposure to plants. Lansing and Kremer (1993) demonstrated that each subak's yield is better on average than it would be otherwise by virtue of the religiously facilitated wide-scale coordination of competing subak.

Unfortunately, studies as detailed and comprehensive as that of Lansing and Kremer (1993) are rare. This scarcity of research is particularly unfortunate because as markets increasingly engulf local economies, the need is greater than ever to understand the hard-won and time-tested cultural solutions for resource acquisition and management that have stabilized and ultimately sustained their communities.

Hypothesis 3: Signaling Rituals

Many have referred to religion as a social glue that binds people together (see, e.g., Graham & Haidt, 2010). Indeed, the likely Latin derivative of the word religion, religare, means "to bind." But how is this binding accomplished? The currency of social bonds is prosocial behavior, but one question that haunts evolutionary analyses of human cooperation is the problem of how to determine whom to trust in times of need. In the context of religious prosociality, ritual behavior is a strong candidate. Specifically, because of their public visibility and associated costs, rituals can serve as proxies for reputation and reliably indicate trustworthiness (Sosis, 2005). Across the animal kingdom, costly signals often reliably convey fitness, fertility, and mate quality (see Searcy & Nowicki, 2005; Zahavi & Zahavi, 1997). Religious groups often provide social and resource benefits to adherents, benefits that are susceptible to exploitation. Ritual systems that entail somatic, economic, social, time, or opportunity costs can, however, protect these benefits. Ritual performance not only conveys commitment to supernatural agents accepting or receiving the sacrifice, but it also conveys commitment to the community that proclaims the agent. Such rites can also serve as an effective cultural bulwark against various forms of exploitation if costs are high enough to prevent likely defectors from performing rituals without concomitant beliefs and commitments.1 A number of studies have bolstered the explanatory power of the signaling theory of religion.

Sosis and Bressler (2003) found that religious communes outlast secular ones by a significant margin; at the end of each year, religious communes were 4 times as likely to still exist than secular ones. Notably, the strongest predictor of which religious communes survived the longest was the number of costly displays of commitment to the group. Those communities that offered their individual members more opportunities to display their commitment to the group saw the lowest rates of dissolution from internal or external strife. Sosis, Kress, and Boster (2007) found that those societies that needed the high levels of coordination required for warfare also engaged in riskier and more taxing rituals. Soler (2012) found a significant relationship between increased cooperation and commitment to ritual participation among Candomblé cult members in Brazil. Similarly, Sosis and Ruffle (2003, 2004; Ruffle & Sosis, 2007) found that religious kibbutzim engaging in expensive religious commitments are more cooperative and generous with each other than with their secular equivalents. Berman (2009) argued that even actions such as sending one's children to religious schools (which he showed provides demonstrably lower future returns on investment per year of education) serve as a form of sacrificial display of commitment to one's religious group. These studies suggested that, indeed, costly religious rituals reliably convey commitment to other people. As such, it overcomes problems inherent in human relationships regarding who is trustworthy; reliable partners in cooperative ventures are those willing to demonstrate commitment at a cost to themselves. This commitment therefore translates to increased cooperation and establishes social bonds that promote individual well-being, which is ritual's adaptive function. Among other things, what religious concepts do is provide an unverifiable, powerful, and ageless impetus for engaging in and maintaining costly ritualistic traditions as well as provide a means by which people can communicate shared mental states (Purzycki & Sosis, 2010).

However, although these studies may explain why rituals build trustworthy and cohesive societies, researchers have little understanding of the proximate psychological mechanisms responsible for equating costly, ritualized displays of commitment with trustworthiness. Can other factors mediate perceptions of trustworthiness in a religious context? What are the factors involved in changing the perceived cost of ritual acts? These questions likely revolve around the nature of human institutions in which people have shared expectations and meanings for things. The operative word here is shared. However, as discussed next and in Exhibit 9.1, various traditions appear to measure sharedness and conformity in different ways.

Hypothesis 4: Cohesion Rituals—The Case of Synchrony

What are the proximate mechanisms involved in behavioral conformity? One answer may lie in the recent research on synchrony, wherein multiple people engage in similarly coordinated behaviors such as singing or dancing. In a seminal article, Wilmereth and Heath (2009) showed that individuals instructed to move in time with other research participants (as opposed to engaging in the same behaviors but doing so out of sync)

1 In Heinrich's (2009) model of credibility-enhancing displays, the signals of commitment need not be costly to the honest signaler, only too costly for a dishonest signaler to fake.
EXHIBIT 9.1
Religious Conformity: Doxa and Praxis

One popularly entertained idea is that religions function to maximize ideologi-
cal conformity. Perhaps surprisingly, though, with the notable exception of a few
imperialistic traditions, having faith or belief in the same religious concepts as oth-
ers in the community is not considered vital to most of the religious traditions
that have existed through the ages. These traditions often emphasize behavioral con-
sistency and participation, that is, practice, as the mark of religiosity rather
than consensus in belief (see Fernández, 1985). It tends to be only the universalizing
and often imperialistic religious traditions—which seek to include a wide variety of
diverse groups—in which faith is indicative of religiosity (Furzycki & Sosis, 2011).
In other words, different contexts appear to influence the factors that indicate
what it means to be religious. A. B. Cohen, Siegel, and Rozin (2003) predicted
that an emphasis on practice—and not on faith—is likely associated with ethnicity-
bound traditions. Indeed, if a religious group considers itself to be different by vir-
tue of some internal essence (see Gil-White, 2001), then likely less need exists to
demonstrate ideological conformity than in those traditions—such as Christianity,
Islam, and Buddhism—in which anyone can be a member. In support of this the-
sis, A. B. Cohen et al. (2003) showed that that Protestants are significantly more
likely than Jews to emphasize faith as an indicator of religiosity. The distinction
between an emphasis on belief versus one on practice presents a compelling and
illuminative example of different adaptive solutions that culturally evolved from dif-
ferent social needs and pressures.

reported higher levels of similarity, connection, and trust with their group
members and also showed higher levels of coordination and self-sacrifice for
their group. Paladino, Mazaurega, Pavan, and Schubert (2010) found that
watching others receive identical sensory stimulation (in this case having
their cheek brushed) in synchrony rather than out of synchrony not only felt
more resemblance to and attraction for their sensation partner, but actually
affected, at some level, confuse themselves with the other subject, perceiving
more agency over the other person and experiencing "body illusions" of
feeling one's own sensations in the location of the other person. Notably,
synchonic participants also showed more conformity in their responses
than the asynchronous ones.

Similarly, synchronic behavior has been shown to increase both pain toler-
ance and, perhaps as a consequence, work output (E. A. Cohen, Eijmond-
frey, Knight, & Dunbar, 2010). Moreover, neuroimaging research has revealed
that the intense audiovisual sensory experiences that often accompany reli-
gious rituals actually inhibit self-related processing (Goldberg, Harel, &
Malach, 2006). The effectiveness of synchrony at promoting the importance of
the group at the expense of the individual likely explains its persistence
across a vast variety of religious rituals—from the Sufi whirling devore to the
coordinated movements (Rak’a) performed during Muslim prayers to the
collective hymn singing that is found throughout religions. Of course, religious

are not the only institutions to have leveraged the socially cohesive effects of
synchronic behaviors. As Wilteroth and Heath (2009) pointed out, modern
militaries maintain frequent marching drills even though marching has all but
been abandoned as an actual strategy in military engagement. Various forms of
dancing, such as the coordinated step dances of primarily African American
fraternities and sororities, likely achieve the same type of social binding.

Future research would do well to investigate whether other aspects
common to religious rituals—for example, subordination postures—produce
similar effects for submitting individual interests to those of the group.

Hypothesis 5: Management of Competitors, Defectors,
and Other Threats to Influence

As religious systems bind ingroup members, religions also often endorse
mechanisms that manage potential outgroup disruptions to social order. For
example, Streakman and Palmer (2008) argued that the various witch hunts
around the world have been directly tied to perceptions of threats to the
social order. They predicted that “witch-kilings occur only when there is a
significant threat to the social hierarchy of the killers and those supporting
them,” noting that the rush of witch hunts in Europe “began and ended with
the Reformation and Counter-Reformation” (p. 168). Such killings appear
to have little to do with fear that witchcraft has efficacy but more with the
social consequences of killing witches. This explains why suspected witches
are typically vulnerable individuals; they are a less risky group of people to
dismissively deify to demonstrate the authority of leaders.

In the Abrahamic traditions, antiatheist teachings are explicit and perva-
sive in scriptures and sermons. For example, the Shemoneh Esrei, which
is recited thrice daily by observant Jews, includes a paragraph against non-
believers who can threaten the continuity of the community. The Qur'an,
meanwhile, instructs that bodily harm should be done to unbelievers in this
life (e.g., 8:59–60) and promises even more grievous punishment in the next
(2:19–20). The worst fate is reserved not for pagans or Jews but for apostates
who were formerly Muslim but have left the faith (3:90)—thereby doubling
as a powerful disincentive for doubt among current believers. (Apostasy in
Islam can include a rejection of either the existence of God [religious belief]
or of obligatory rituals [practice]. The distinction between these two forms
of religious conformities is discussed more in Exhibit 9.1.) Certain hadiths
imply that the appropriate punishment for apostasy should be death for men
and life imprisonment for women, and although the meaning and application
of these hadiths are topics of active debate among modern Islamic scholars
(e.g., Saud & Saud, 2004), apostasy remains illegal in a number of Muslim-
majority countries and a capital crime in Saudi Arabia and Iran.

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The codified disparagement of atheism can be understood as a self-protective device on the part of religions aiming to discourage defection from their cultural system. From the perspective of religious prosociality, however, antiatheist prejudice can also be understood as a reaction against a moral threat. If cooperation and trust rely on the shared religious beliefs of those surrounding one, then members of one's society who explicitly reject these beliefs are immediately morally suspect. This theory fits recent empirical findings. Examining the virulent antiatheist prejudice in North America—polls have consistently shown atheists at the top of lists of most disliked groups (Edgell, Gerreis, & Hartmann, 2006)—Gervais et al. (2011) found that these intense negative attitudes are driven by a profound moral distrust. Antiatheist prejudice appears most prominently in high-trust situations. Participants were not overwhelmingly concerned about being served food by an atheist (a low-trust situation) but were highly unwilling to hire one for babysitting (a high-trust situation). When given a scenario briefly describing a man of dubious moral character, participants were as likely to implicitly attribute the description to an atheist as they were to a rapist.

Research has also found that antiatheist prejudice does not exhibit the typical signature of standard social identity-driven ingroup-outgroup psychology. As Gervais et al. (2011) discussed, these standard models fail to account for the domain specificity of the antipathy (confined to trust-based situations) or the lack of a corresponding ingroup preference on behalf of nonbelievers. Instead, the distrust of non- and other-believers can be seen as the direct—and selected-for—outcome of the emphasis religions put on a trusted community of common believers. In a sense, these are flip sides of the same cultural adaptation.

Open questions remain. How does the distrust people feel toward nonbelievers compare with the distrust they feel toward believers of other religions? Consistent with theoretical predictions that the fear of any God is preferable to the fear of none, preliminary research has indicated that people are more inclined to distrust a believer from another religion than someone from their own religion who thereby shares a social identity but who nonetheless claims nonbelief (Shariff & Clark, 2012).

The bulk of the research on attitudes about atheists has, however, been conducted primarily with Christian participants. Another open question is how differently members of religions that rely more on religious practice than belief as a cue of religiosity (see Exhibit 9.1) feel toward atheism. Might the level or kind of prejudice differ in, say, Judaism? Finally, what role will the vastly increasing number of atheists have on antiatheist prejudice and on religion in general? Gervais (2011) showed that people led to believe that atheists were more, rather than less, prevalent in their community showed higher levels of trust. As the "otherness" of atheists decreases, so too might the prejudice directed against them. That said, it remains possible that the rise of a more coalition form of atheism, which could unify nonbelievers into a coherent ingroup, may provoke more aggressive responses.

Hypothesis 6: Marriage and Other Regulations on Sexuality and Reproduction

Religion may also be credited with the salutary effects that monogamous marriage norms have had on societies. Polygyny is common among other primates and has been a demonstrable feature of human mating patterns throughout history—the vast majority of societies in the anthropological record permitted men to take multiple wives (White et al., 1988). The historical transition from nomadic hunter-gatherer lifestyles to permanent settlements, however, amplified the destabilizing effect that such polygyny norms had on human groups. As the wealth inequality between men grew, so did the inequality in the number of wives that men could acquire. The ability of a handful of wealthy, high-status men to monopolize a disproportionate share of mating opportunities led to a large and particularly socially disruptive underclass of unpaired men. Facing restricted sexual opportunities, unpaired men of reproductive age are liable to engage in increasingly desperate, risky, and often violent behavior (Wilson & Daly, 1985). Consistently, the historical anthropological record has shown that polygynous societies had higher rates of crime and engaged in higher levels of warfare than did predominantly monogamous ones (Bacon, Child, & Barry, 1963; White & Burton, 1988). Even today, societies with higher rates of polygyny show higher levels of murder, rape, and robbery (after controlling for relevant variables such as gross domestic product per capita and economic inequality; Kanazawa & Still, 2000).

Modern monogamous marriage norms, which originated in ancient Greece 2,500 years ago and spread via the vehicles of Christian expansion and European colonialism, are thus likely to be adaptive cultural innovations that offer increased stability to large, unequal groups (Henrich, Boyd, & Richerson, 2012). Had those societies that adopted monogamous marriage norms been more able to restrict the antisocial consequences that accompany polygyny (while at the same time increasing paternal investment in offspring and generally redirecting the energy men devoted to finding ever-increasing numbers of wives), then the increased stability of these societies would make them more competitive in the cultural evolutionary market (Henrich et al., 2012)."
Although they are likely to have strengthened groups, these norms ran counter to the evolved sexual strategies of individual men—and were particularly unappealing for high-status men who had the greatest opportunities for polygynous pursuits, thus making marriage a hard sell, especially for those with power. As with other group-beneficial but personally costly phenomena, tying these norms to religion would have been a particularly efficacious way of ensuring they had the strength to restrict behavior. Research has shown that norms are more likely to be adopted when they are backed by religious edict (Bushman, Ridge, Das, Key, & Basrah, 2007). Moreover, in societies with weak legal enforcement, religion served not only as the primary moral authority but also as the only one whose sanctions could be most trusted to apply equally to those at the top of the hierarchy (whose behavior, in this case, needed the most regulating).

Today, ample evidence exists for the relationship between religion and monogamous sexual behavior. In the United States, religious adherents have significantly fewer lifetime sexual partners than those who are not religious (Billy, Tanfer, Grady, & Klepinger, 1993). They also have lower rates of premarital sex (Beck, Cole, & Hammond, 1991; Hohlt & Goodwin, 1981; Zelnik & Shah, 1983), are more likely to get married (Thornton, Axinn, & Hill, 1992), have higher marital satisfaction (Call & Heaton, 1997; Wilson & Filsinger, 1986), and have fewer extramarital affairs (Arkin, Bascoum, & Jacobson, 2001; Reiss, Anderson, & Snowden, 1980). Although these findings are supportive, future research would do well to explore historical trends to see whether the spread of religions with monogamous norms indeed increased levels of monogamy and social stability.

Aside from providing social stability via marriage norms, religions may also have contributed to the success of culture groups by maximizing fertility. Today, fertility rates have declined all across the world but have done so at a slower rate among those who are religious—and particularly those of the more conservative and orthodox religious sects (Berman, 2000). At both the individual and the national level, religiosity is one of the strongest predictors of family size, even after controlling for important related variables (Blume, 2005; Frejka & Westhoff, 2008; Kaufmann, 2010; Lehrer, 1996). One provocative suggestion as to why religious people have lagged behind the general trend of reduced fertility is that religiously backed norms maintain entrenched gender roles while simultaneously promoting a “cult of motherhood and fertility” (Beit-Hallahmi, 1997, p. 167). Restrictions preventing women in highly religious cultures from accessing education and economic autonomy have prevented these women both from exercising as much control over their reproductive decisions and seeing alternative opportunities to motherhood as women in other cultures. This suggestion has received some support, especially among rural populations (Amin & Alam, 2000); however, it is an important topic that is ripe for more research. Although historically these high rates of fertility likely allowed religious groups to grow into very populous cultural groups that could outcompete less fertile ones, these norms may today be a double-edged sword. High birth rates in modern times are tied to cycles of poverty and economic stagnation—drawing into question just how culturally adaptive these norms should still be considered.

CONCLUSION

The preceding sections are not meant to be an exhaustive list of cultural adaptations that religions offer groups. We have scarcely mentioned many other likely important group functions that religious rituals and proscriptions may serve—mostly because of a lack of available research. For example, researchers have begun to discuss the idea of a cultural immune system consisting of cultural practices that are devoted to avoiding and managing the spread of virulent pathogenic diseases. The preferential culinary use of spices with antibacterial properties in areas of high pathogenic load is one off example (Sherman & Billing, 1999; see Henrich & Henrich, 2010, for another example). It is very likely that many religiously sanctioned dietary and cleansing rituals serve similar disease-avoidance purposes. Although much anthropological research has been devoted to the great variety of these types of rituals, little of it has adopted the functionalist perspective featured here. Doing so in the future, however, may provide a critical tool for understanding the culturally adaptive reasons why these and other rituals and edicts exist.

Investigating the culturally evolved group utility that religions serve must, however, resist the pull of naïve pan-adaptationism. Not every aspect of religions evolved to serve the group. For one thing, as briefly discussed in the introduction, many aspects may have developed to directly serve the individual. In addition, though, many aspects of religions can be destructive to both groups and individuals. Cases such as the Jonestown and Heaven's Gate mass suicides illustrate the disastrous results for constituents when the costs of commitment are so drastically outweigh the benefits of devotion. Indeed, aspects of religions that convey no adaptive advantages to the group or to the individual can persist for generations without being extinguished simply because they effectively sustain belief in that religion (see Shariff, 2008, for a discussion).
Finally, as changes occur to the sociocultural environment in which religions exist—including the growth of competition from other religions, ideologies, and social institutions, hitherto adaptive elements can become inert and even negative to the welfare and survival of the group and group members. As typically conservative and tradition-rich institutions, religions may be slow to adapt to these changes, leading them to lose market share, or they may maintain the devotion of their adherents but condemn them to diminishing returns in comparison with other contemporary social institutions. The future, ultimately, will belong to those religions that combine the best group- and individual-level cultural adaptations for the current environment and provide the best solutions to both the persistent and the novel challenges of modern life.

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